

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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In the Matter of }

Redevelopment of Spectrum to }
Encourage Innovation in the }
Use of New Telecommunications }
Technologies }

ET Docket No. 92-9

RM-7981

RM-8004

To: The Commission

Comments of EMI Communications Corporation

EMI is pleased to comment on the above referenced Docket and the associated Further Notice of Proposed Rule Making released September 4, 1992.

We applaud the Commission on its initiative in promoting the development of new technologies and the courage to propose such a controversial reallocation plan.

As a common carrier operator of microwave transmission facilities including 2 GHz systems, EMI clearly will be affected by the actions associated with this docket.

In general, EMI is in support of the actions, but maintains a posture of concern where most recent statements would appear to reflect opinions that microwave radio should not continue to proliferate as a trunking or long haul transmission medium.

The following comments/suggestions are respectfully submitted for review along with our appreciation of being included in this process.

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*** ALTERNATE SPECTRUM IN THE 2 GHz RANGE MAY BECOME AVAILABLE**

and

*** CO-PRIMARY LICENSE STATUS ***

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It is appreciated that the Commission is supporting the American economic position by promoting domestic development of new technologies. We agree that making spectrum available for such development is necessary.

It is recognized that the Commission is striving wherever possible to conform with the WARC spectral assignments and in the case of PCS to develop frequency commonality. However, based on the current 2 GHz utilization in the United States by common carriers, operational fixed services and government entities, the overall cost to migrate systems will ultimately be burdened by consumers which may have a negative impact to public interest.

Indeed, Personal Communications Systems may greatly serve the public interest and the 2 GHz range appears to be well suited for the application.

It would be in the public interest to utilize 1710-1850 MHz for the displaced 2 GHz point-to-point operators. Progress with NTIA about this issue must continue in a most expedient manner (1).

Another possibility could be 2500-2690 MHz which is currently assigned to ITFS/MMDS that may not actually realize its proposed potential in light of most recent technological/regulatory actions and consumer demands.

However, if the Commission must allocate the 1850-2200 MHz bands for the development of omni directional systems and displace the existing operators currently providing service to the public, we strongly promote the suggestion of a 10-15 year transition period of co-primary status. Likewise, if the proposal of industry financial negotiations for earlier migration is implemented, we strongly feel the FCC should exercise restraint and conservatism where Special Temporary Authorities or Temporary Fixed Authorities may be granted. It is easily foreseeable that a new technology operator, in haste to provide service could jeopardize the integrity of an existing point-to-point system that is not yet prepared to migrate. The full Prior Coordination Notice and Public Notice processes should be steadfastly maintained as is suggested in the Further Notice of Proposed Rulemaking.

(1) This band is close enough to the current 2 GHz non-government allocations that the propagation characteristics would be virtually the same. Much of the equipment that is presently in operation could be retuned to operate in this frequency range which would minimize migration cost. The exploration of feasibility for non-government sharing of this band should be concluded prior to actual migrations of existing operations.

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*** EXISTING ANALOG SYSTEMS MUST BE PROTECTED ***

EMI concurs with Comsearch and the UTC regarding existing analog systems (2).

We feel that it would be a major oversight not to continue to protect the operational integrity of existing and evolving analog networks (3).

As an operator of a combined analog and digital microwave network, EMI as well as other "combined network" operators continue to serve public interest utilizing analog technology. The networks continue to evolve through the addition of spurs and RF overbuilds.

It is agreed that the proliferation of digital transmission systems exceeds that of analog and that new analog equipment sales would appear to be greatly reduced in recent years. The reduction in new analog sales does not indicate a lack of desire to support the maintenance and continued development of these networks by operating companies, but in our opinion reflects reduced development and availability of new analog equipment by the manufacturers.

Truly, this is a supply and demand argument that exceeds the intended scope of these comments. However, the point remains that as analog systems continue to exist and evolve, technical and operational standards must likewise continue to support those systems which are profitably serving the public interest. If baseband channel loading requirements are dropped in favor of "bits per Hertz" exclusively, we predict spectral inefficiency will result. Likewise, if other analog technical standards are not maintained, operational integrity of the systems will also suffer.

EMI suggests that analog and digital standards be maintained and developed in tandem until the need no longer exists.

(2) The operational integrity of the numerous operating analog systems must be protected by continual maintenance and development of technical standards and loading requirements.

(3) Presently there are 33,548 analog message transmitters/receivers protected in the 4 GHz common carrier band (11,048 digital), 15,508 analog message transmitters/receivers protected in the 6 GHz common carrier band (32,871 digital) and 2,948 analog message transmitters/receivers in the 11 GHz common carrier band (13,549 digital). Information source, Comsearch as of September 1992.

*** THE PROTECTION OF GROWTH FREQUENCIES CANNOT BE SACRIFICED ***

In the most recent NPRM the Commission suggests limiting growth protection "such as a six month reservation period" and solicits comments.

From a common carrier perspective, limitation of growth protection would be tantamount to nonprofitability.

The actual cost to develop and maintain a microwave system varies. In some cases, a system could provide profit by operating two or four frequencies, in other cases, it takes more channels. It would be unrealistic to assume that a common carrier would build a microwave system only if the immediate traffic would provide a capital rate of return.

A common carrier will build a system as an investment. Often the investment is made based on projected traffic/revenue. The FCC through channel loading requirements insures that spectrum is utilized to service public interest and not just invested in without using it. However, as is often the case, building a system and using spectrum is not always immediately profitable. The profit will be realized in the future, which justifies the investment.

It is breach of the rules to build a multifrequency system just to protect growth to insure future profits. Likewise, it is unrealistic to assume that a major investment would be made without the ability to protect the profit generating portion of that investment.

If the commission imposes a limitation on protecting growth frequencies, it is likely that the common carrier microwave industry that serves public interest could cease to exist through lack of investment dollars.

*** THE PROPOSED COMMON CARRIER 6 GHZ CHANNEL PLAN IS FLAWED ***

It was brought to the attention of Alcatel at a recent National Spectrum Managers Association (NSMA) meeting in Chicago (September 14-17, 1992), that there is a short coming in the proposed carrier frequency assignments for the 6 GHz common carrier band.

Presently, the band is channelized with 29.65 MHz frequencies. Alcatel proposes overlapping new assignments based on compatibility with 30 MHz carriers.

If the new assignments were compatible with 29.65 MHz channels or if the existing channels were 30 MHz wide frequencies (instead of 29.65) a frequency coordinator could use cross polarization techniques to most efficiently utilize spectrum. However, if the band is assigned with channels which variably overlap with existing frequencies, what should be adjacent channels become semi-adjacent. This would mean that in many instances cross polarization could not be used to resolve interference conflicts, which would result in spectrum inefficiency.

Exhibit A illustrates the channel frequency overlap variation. As can be seen, at the low end of the 6 GHz band, the overlap is minimal (approximately 200 KHz) but as the channel numbers increase, the overlap also increases to a maximum of approximately 2020 KHz (or 2.2 MHz) at the center of the band.

In addition to the above noted short coming, the proposed 400 KHz, 800 KHz, 5 MHz and 10 MHz plans would also present frequency coordination problems if interleaved across the existing channel plans. The coordination problems would result in spectral inefficiency which cannot occur when considering additional users in an already congested frequency band.

EMI proposes the following modifications to the Alcatel plan which will minimize the above noted flaws:

- 1) Adjust the 30 MHz Alcatel plan carrier frequencies to match the current "T" plan carrier frequencies. This eliminates the overlap variation problems.
- 2) Where applicable, interleave the 400 KHz, 800 KHz, 5 MHz and 10 MHz channels into the "T" plan frequencies utilizing the "guard band" channels at 5925.5, 6172.5, 6177.5 and 6424.5 MHz. These "T" plan frequencies (10 T, 19 T, 20 T and 29 T) represent a total of approximately 25.6 MHz of spectrum and will not adversely affect the current industry use of the standard eight pairs of 29.65 MHz "T" plan channels in the band.

It should be noted that the "T" plan was used as a reference above because it is by far the most commonly used frequency plan in the 6 GHz common carrier band. However, mention should be

made that the above interleaving will affect the "S" plan which is occasionally utilized in heavily RF congested areas.

EMI additionally recommends that existing operations and growth of systems utilizing "S" plan frequencies should be grandfathered.

*** NARROW BAND SIGNALS IN A WIDE BAND ENVIRONMENT ***

With the adoption of the proposed Alcatel channel plans into the NPRM an obvious concern becomes one of spectral inefficiency.

With a mix of narrow and wide band carrier frequencies utilizing the same spectrum, inefficiency becomes unavoidable and steps must be taken to minimize spectral waste.

For example, in a highly RF congested area such as New York City in the common carrier 6 GHz band, an occasional 29.65 MHz "T Plan" frequency may be available (depending upon azimuth, frequency offset and various other factors).

If a narrow band signal (5 MHz bandwidth) is licensed in the same spectrum as a 30 MHz (actually 29.65) carrier, then potentially 25 MHz of spectrum will remain fallow or wasted.

To minimize this potential situation, EMI proposes that in the 6 GHz and 11 GHz common carrier bands the signals that occupy less bandwidth than the presently operating channel plans be directed to the "guard bands" at the upper, lower and center of the current bands.

It is foreseeable that in some cases the guard band spectrum will not be available or technically feasible to use. In those cases, a showing could be supplied with an application indicating why the band edges are unsuitable for the specific stations. In that case, use of the wider band allocated spectrum could be authorized. However, care must be taken that the applicant is authorized spectrum as close to the band edges as is practical.

This logic is displayed in the discussion and proposal suggested by EMI on page 4 of this document. The same logic should be utilized in all frequency bands which are subject to a mix of signals of varying emission bandwidths and transmitter characteristics.

THE 6 GHZ PRIVATE BAND SHOULD BE SUBJECT TO PRIOR COORDINATION

Regarding the 6 GHz private band, we see no reason why the formal Prior Coordination Notice process should not apply.

With the potential increased utilization of this band due to migration and band sharing the prior coordination notice process would seem to be necessary for spectrum efficiency.

The process has proven to work effectively in the common carrier bands and has minimized challenges to applications for license authorizations before the Commission.

*** Part 21.703 and 21.710 *
(channel loading & band width)**

If rechannelization of the 6 GHz common carrier band should include the proposed 400 KHz, 800 KHz, 5 MHz and 10 MHz allocations, rewriting of channel loading requirements and allowable bandwidth becomes necessary.

Presently, in the 5925 to 6425 MHz band (6 GHz common carrier) the minimum number of voice circuits required is 900 or 10 Mb/s (21.710).

Part 21.703 specifies 30 MHz as the maximum authorized bandwidth, this implies less bandwidth may be authorized. However, 21.710 specifically limits minimum loading (above noted) and is not applicable considering current technology and the proposed channels.

*** ECONOMIC DISCUSSION ***

There is an economic benefit for the federal government to promote the continued operation of point-to-point microwave. Specifically, to protect the investments made by the common carrier industry in existing systems.

As a communications network evolves within a financially secure company, profits are generated. These profits represent revenue not only to the operating company, but also to our government through taxes paid by the company itself as well as its employees.

To prematurely change out an operating system, either through migration or change of technology requires capital investment.

The capital investment represents a tax credit which will ultimately result in a reduced tax base for the government. In a worst case, a requirement to recapitalize a communications network could drive a company into an economic crisis which could negate profits. Not only would the company itself suffer, but the country as a whole suffers because aside from a reduction in corporate tax revenue, people lose jobs and the ripple effect continues.

This is not intended to be a basic course in economics, but an argument in opposition to forced migrations, be they to alternate radio spectrum, modulation types or transmission medium.

We encourage the Commission to promote economic stability while factoring public interest into an equation of technological advancement. As stated earlier, we appreciate that the Commission is supporting the American economic position by promoting domestic development of new technologies. We agree that this is necessary and beneficial. However, a careful and well studied approach must be taken when initiating rules that impact an already financially insecure and volatile industry.

EXHIBIT A

"T" Plan Low Frequencies 29.65 MHz	Alcatel Plan Low Frequencies 30 MHz	Frequency Overlap
5925.5-----	N/A	
5945.2-----	5945-----	.2 MHz
5974.8-----	5975-----	.2 MHz
6004.5-----	6005-----	.5 MHz
6034.2-----	6035-----	.8 MHz
6063.8-----	6065-----	1.2 MHz
6093.5-----	6095-----	1.5 MHz
6123.1-----	6125-----	1.9 MHz
6152.8-----	6155-----	2.2 MHz
6172.5-----	N/A	

"T" Plan High Frequencies 29.65 MHz	Alcatel Plan High Frequencies 30 MHz	Frequency Overlap
6177.5-----	N/A	
6197.2-----	6195-----	2.2 MHz
6226.9-----	6225-----	1.9 MHz
6256.5-----	6255-----	1.5 MHz
6286.2-----	6285-----	1.2 MHz
6315.9-----	6315-----	.9 MHz
6345.5-----	6345-----	.5 MHz
6375.2-----	6375-----	.2 MHz
6404.8-----	6405-----	.2 MHz
6424.5-----	N/A	

It should be noted that the "T" plan was chosen for illustration because it is the most commonly used channel plan in the 6 GHz common carrier band and the closest to the Alcatel plan by carrier frequency. However, the staggered "S" plan and the split "C" & "U" plans should also be considered.

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